IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): **Chen, et. al.** Application Serial No.: **10/631,947** Filed: **July 30, 2003** Title: **METHOD AND SYSTEM FOR CONFIGURING GATEWAYS TO FACILITATE A MODEM CONNECTION OVER A PACKET NETWORK**	Group Art Unit: 2616 Examiner: O'Connor, Brian T.

APPEAL BRIEF

Mail Stop Appeal Brief – Patents
Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir/Madam:

This is an Appeal from the Examiner's Final Rejection of claims 1, 3, 6, 7, 9, 13, 15, 18 and 20. The Final Rejection issued on October 15, 2007, and the Advisory Action issued on December 27, 2007. The Notice of Appeal was filed in the U.S. Patent and Trademark Office on January 9, 2008.

REAL PARTY IN INTEREST

The real party in interest is Mindspeed Technologies, Inc.

RELATED APPEALS AND INTERFERENCES

There are no related Appeals or Interferences.

STATUS OF CLAIMS

Claims 1, 3, 6, 7, 9, 13, 15, 18 and 20 are pending, and claims 2, 4, 5, 8, 10, 11, 14, 16, 17, 19, 21 and 22 were canceled in previous amendments. Claims 1, 3, 6, 7, 9, 13, 15, 18 and 20 have been finally rejected in a Final Rejection, dated October 15, 2007. This Appeal is directed to the rejection of claims 1, 3, 6, 7, 9, 13, 15, 18 and 20. Claims 1, 3, 6, 7, 9, 13, 15, 18 and 20 appear in an Appendix to this Appeal Brief.

STATUS OF AMENDMENTS

No claim amendments have been entered after issuance of the Final Rejection of October 15, 2007.

SUMMARY OF CLAIMED SUBJECT MATTER

A. Brief Summary

FIG. 1 of the present application illustrates a block diagram of a conventional communication model for Modem over Internet Protocol ("MoIP") based on a packet-based network, such as the Internet. As shown in FIG. 1, communication model 100 includes first modem (M1) 110 in communication with first gateway communication device (G1) 120 over PSTN providing transmit and receive channels 112 and 114. Communication model 100 further includes second modem (M2) 150 in communication with second gateway communication device 140 (G2) over PSTN providing transmit and receive channels 144 and 142.

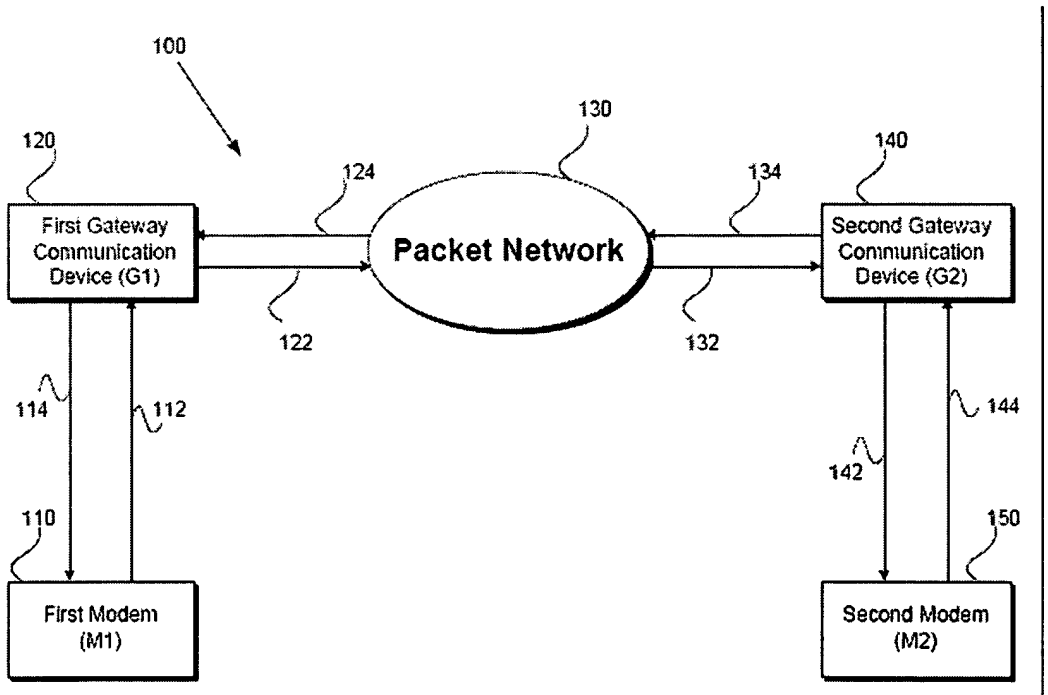

FIG. 1
(PRIOR ART)

Conventionally, the communication process for MoIP begins when M1 110 calls G1 120. As a result of receiving such call from M1 110, G1 120 calls G2 140, and G2 140 in turn calls M2 150. In order to support VoIP, in their default mode of operation, G1 120 and G2 140 start to communicate in voice mode and are configured to use a compressed voice protocol, such as the ITU standard G.723.1. However, when M2 150 answers the incoming call from G2 140, M2 150 generates an answer tone, e.g. a single tone at 2100 Hz, that causes G1 120 and G2 140 to switch to a higher quality voice protocol, such as an ITU standard G.711, which provides toll quality audio at 64 Kbps using either A-Law or mu-Law pulse code modulation methods. This digital format is used in order to allow easy connections to legacy telephone networks. By switching to G.711, the tones generated by M2 150 may propagate through G2 140 and G1 120 with less distortion in order to reach M1 110 at the other side. As a result of configuring G1 120 and G2 140 for a new mode of operation, which is commonly referred to as modem pass through mode, G1 120 and G2 140 facilitate a toll quality voice path, through which path, M1 110 and M2 150 may communicate with one another. In order to minimize the effect of network impairments, such as packet losses, jitter and delay, in the modem pass through mode, G1 120 and G2 140 further configure themselves to adjust the jitter buffer size, disable echo suppressors and disable echo cancellers.

Traditionally, G2 140 determines that M2 150 is a modem and switches to modem pass through mode as a result of detecting the answer tone that is transmitted by M2 150 after being placed off-hook in response to G2 140 call. Once G2 switches to pass through

mode, the answer tone is transmitted to G1 120 using a higher quality voice coding algorithm, such as G.711, which encodes the answer tone for transmission by G2 140 to G1 120 over packet network 130. Further, once G1 120 detects the encoded answer tone from G2 140, G1 120 also switches to pass through mode.

As it is known in the art, a modem answer tone has different types, such as pure answer tone (ANS), amplitude-modulated answer tone (ANSam), phase-reversed answer tone (/ANS), and phase-reversed amplitude-modulated answer tone (/ANSam). ANSam is known to be a sinewave at 2100Hz signal, which is amplitude modulated at 15Hz, and is indicative of modem modulation capabilities according to ITU-T V.34, V.90 or V.92 standards. A phase-reversed answer tone also indicates high-speed modem modulation capabilities that are facilitated by standards such as ITU-T V.32, V.32bis, V.34, V.90 and V.92 or protocols such as K56.

Typically, upon the detection of the phase-reversed answer tone, network echo cancellers are disabled. It is known that network echo cancellers interfere with high-speed modem connections and may cause modems to fall back to lower speeds during the training and negotiation phase. Therefore, it is desirable that G1 120 and G2 140 disable their echo cancellers upon detection of a phase reversal in the answer tone. However, based on the existing implementations of the modem pass through mode, G1 120 does not detect the phase-reversed answer tone (/ANS or /ANSam) reliably due to network impairments and the fact that G1 receives an encoded version of the phase-reversed answer tone, which is encoded using a voice protocol, such as G.723.1, G.711, G.729 or

the like. In the event that G1 120 fails to detect the phase reversal, G1 120 does not disable its echo canceller, and M1 110 and M2 150 connection speed may fallback to lower speeds as a result of the interference caused by the echo canceller of G1 120.

One approach for avoiding the failure to detect the phase reversal by G1 120 is that, G2 140 performs the answer tone detection and, upon detection of ANS, ANSam, /ANS and /ANSam, transmits an appropriate message indicating one of ANS, ANSam, /ANS and /ANSam. However, this approach has a major drawback, because the phase the phase reversal occurs about every 450ms, and G2 140 must wait at least that long to determine a phase reversal in order to decide which one of ANS, ANSam, /ANS and /ANSam messages should be sent to G1 120.

The invention of independent claims of the present application overcomes this major drawback in the art by a division of the answer tone and the phase reversal detection process, and for example, according to the invention of claim 1, by sending a first message indicative of the detection of the answer tone by G2 140 to G1 120, which detection may occur in about 50-100ms, and then continuing to look for the phase reversal, and sending a second message regarding the phase reversal by G2 140 to G1 120, which detection may occur in about 450ms.

A. Claim 1

Independent claim 1 claims a communication method for use by a first gateway device (G2 370) to enable communication between a first modem (M2 302) and a second

modem (M1 301), the first gateway device (G2 370) being capable of communicating with the first modem (M2 302) over a first communication line (see FIG. 3), the first gateway device (G2 370) being capable of communicating with a second gateway device (G1 350) over a packet network (330), the second gateway device (G1 350) being capable of communicating with the second modem (M1 301) over a second communication line (see FIG. 3).

The method comprises: receiving (G2 370) a call request for the first modem (M2 302) from the second gateway device (G1 350) over the packet network (330); placing (G2 370) a call to the first modem (M2 302) over the first communication line (see FIG. 3) in response to the receiving; detecting (G2 370) an answer tone transmitted from the first modem (M2 302) over the first communication line (see FIG. 3) in response to the placing; transmitting (G2 370) a first message indicative of the answer tone to the second gateway device (G1 350) over the packet network (330); detecting (G2 370) a phase reversal in the answer tone; and transmitting (G2 370) a second message indicative of the phase reversal to the second gateway device (G1 350) over the packet network (330).

Also, please see steps 230, 235, 240, 245, 260 and 265 of FIG. 2 and related detailed description at page 11, line 8 through page 14, line 2.

B. Claim 7

Independent claim 7 claims a first gateway device (G2 370) configured to enable communication between a first modem (M2 302) and a second modem (M1 301), the first

gateway device (G2 370) being capable of communicating with the first modem (M2 302) over a first communication line (see FIG. 3), the first gateway device (G2 370) being capable of communicating with a second gateway device (G1 350) over a packet network (330), the second gateway device (G1 350) being capable of communicating with the second modem (M1 301) over a second communication line (see FIG. 3).

Similar to claim 1 above, and as shown in FIG. 3, the first gateway device (G2 370) comprises: a receiver configured to receive a call request for the first modem from the second gateway device over the packet network; a call module configured to place a call to the first modem over the first in response to the receiver receiving the call request; an answer tone detector configured to detect an answer tone transmitted from the first modem over the first communication line in response to the call; a transmitter configured to transmit a first message indicative of the answer tone to the second gateway device over the packet network; a phase reversal detector configured to detect a phase reversal in the answer tone; and the transmitter further configured to transmit a second message indicative of the phase reversal to the second gateway device over the packet network.

Also, please see steps 230, 235, 240, 245, 260 and 265 of FIG. 2 and related detailed description at page 11, line 8 through page 14, line 2.

C. Claim 13

Independent claim 13 claims a communication method for use by a first gateway (G1 350) device to enable communication between a first modem (M1 301) and a second

modem (M2 302), the first gateway device (G1 350) being capable of communicating with the first modem (M1 301) over a first communication line (see FIG. 3), the first gateway device (G1 350) being capable of communicating with a second gateway device (G2 370) over a packet network (330), the second gateway device (G2 370) being capable of communicating with the second modem (M2 302) over a second communication line (see FIG. 3).

The method comprises: receiving (G1 350) a call from the first modem (M1 301) over the first communication line (see FIG. 3) for the second modem (M2 302) from; placing (G1 350) a call request to the second gateway device (G2 370) over the packet network (330) in response to the receiving; receiving (G1 350) a first message indicative of an answer tone from the second gateway device (G2 370) over the packet network (330) in response to the placing; receiving (G1 350) a second message indicative of the phase reversal from the second gateway device (G2 370) over the packet network (330) in response to the placing; and disabling an echo canceller (see FIG. 3) of the first gateway device (G1 350) in response to the receiving the second message indicative of the phase reversal.

Also, please see steps 230, 235, 240, 245, 260 and 265 of FIG. 2 and related detailed description at page 11, line 8 through page 14, line 2.

D. Claim 18

Independent claim 18 claims a first gateway device (G1 350) configured to enable communication between a first modem (M1 301) and a second modem (M2 302), the first gateway device (G1 350) being capable of communicating with the first modem (M1 301) over a first communication line (see FIG. 3), the first gateway device (G1 350) being capable of communicating with a second gateway device (G2 370) over a packet network (330), the second gateway device being (G2 370) capable of communicating with the second modem (M2 302) over a second communication line (see FIG. 3).

Similar to claim 13 above, and as shown in FIG. 3, the first gateway device (G1 350) comprises: a modem receiver configured to receive a call from the first modem over the first communication line for the second modem from; a call module configured to place a call request to the second gateway device over the packet network in response to the call; network receiver configured to receive a first message indicative of an answer tone from the second gateway device over the packet network in response to the call request; the network receiver further configured to receive a second message indicative of the phase reversal from the second gateway device over the packet network in response to the call request; and an echo canceller, wherein the first gateway device disables the echo canceller in response to the message indicative of the phase reversal.

Also, please see steps 230, 235, 240, 245, 260 and 265 of FIG. 2 and related detailed description at page 11, line 8 through page 14, line 2.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Claims 1, 3, 6, 7, 9, 13, 15, 18 and 20 are rejected, under 35 USC § 103(a), as being unpatentable over Wildfeuer, et al. (USPN 6,829,244) ("Wildfeuer") in view of McNeill, et al. (USPN 7,161,962) ("McNeill"), and further in view of Schulzrinne, et al. ("RTP Payload for DTMF Digits, Telephone Tones and Telephone Signals," RFC 2833, IETF, May 2000) ("RFC-2833").

ARGUMENT

A. Rejection of Claims 1, 3, 6, 7, 9, 13, 15, 18 and 20 under 35 USC § 103(a)

The Examiner has rejected claims 1, 3, 6, 7, 9, 13, 15, 18 and 20, under 35 USC § 103(a), as being unpatentable over Wildfeuer in view of McNeill, and further in view of RFC-2833. For the reasons stated below, Appellant respectfully disagrees.

Appellant respectfully submits that the cited references, individually or in combination, fail to disclose, teach or suggest the following elements of claim 1: "detecting an answer tone transmitted from said first modem over said first communication line in response to said placing; transmitting a first message indicative of said answer tone to said second gateway device over said packet network; detecting a phase reversal in said answer tone; and transmitting a second message indicative of said phase reversal to said second gateway device over said packet network."

First, with respect to Wildfeuer, it is respectfully submitted that the operation of the system of Wildfeuer is quite different than the invention of claim 1. In Wildfeuer,

packet network gateway 106b (which corresponds to the first gateway of claim 1) does not transmit a first message indicative of the answer tone generated by modem 102b to packet network gateway 106a (which corresponds to the second gateway in claim 1), and also does not transmit a second message indicative of the phase reversal generated by modem 102b to packet network gateway 106a. Rather, as described in Wildfeuer at col. 5, lines 31-47, the answer tone with phase reversal is passed through packet network 110 to packet network gateway 106a, and packet network gateway 106a itself performs the detection of the answer tone with phase reversal. In other words, packet network gateway 106a does not receive messages from packet network gateway 106b regarding the answer tone, but packet network gateway 106a receives the actual answer tone signal that is passed through the packet network, and packet network gateway 106a itself detects the answer tone.

> To set up a modem connection between the calling modem 102a (FIG. 1) and the answering modem 102b (FIG. 1), the calling modem 102a sets up a call using a voice compression standard such as, G.729(a), G.729(b), G.711, G.726, G.723.1, G.729 or any other voice compression standard. This call is like a voice call. In response to the request to set up a call, the answering modem 102b returns a modem signal commonly referred to as an answer back tone to the calling modem 102a. Answer back tone is detected by the TDET 212. Upon the detection of answer back tone by the TDET 212, the PCM controller 112a changes to modem mode. (Wildfeuer, col. 5, lines 31-42.)
>
> In modem mode, the PCM controller 112a implements the G.711 protocol. The PCM controller 112a disables the VAD 210 and the ECAN 208. The memory controller 214 in the jitter buffer 114a controls the playout delay of the memory 204. (Wildfeuer, col. 5, lines 43-47.)

However, the detection of answer tone, and in particular with phase reversal, by packet network gateway 106a (which corresponds to the second gateway in claim 1) may not be properly performed due to various issues, such as packet network delay, jitter, compression, etc. In short, Wildfeuer's system passes through the answer tone for detection by the remote gateway, and does not disclose transmitting a message regarding the answer tone from packet network gateway 106b to packet network gateway 106a, let alone disclosing, teaching or suggesting the transmission of a first message indicative of said answer tone and then the transmission of a second message indicative of the phase reversal from packet network gateway 106b to packet network gateway 106a and, thus, Wildfeuer teaches away from the invention of claim 1.

With respect to McNeill, the Examiner states that McNeill discloses a detection circuit that continuously detects an answer tone and then declares that a phase reversal is present. Appellant respectfully submits that the detection of an answer tone and a phase reversal has been known in the art, and Appellant does not assert that detection of an answer tone or a phase reversal represents any point of novelty. In fact, the existence of an answer tone and a phase reversal, by nature, requires a detector. It is also understood that phase reversal is determined after the detection of answer tone. Therefore, it is respectfully submitted that Appellant does not appreciate the significance of replacing Ahmad with McNeill by the Examiner after Appellant's response to the first Office Action, and as to how the addition of McNeill renders Appellant's arguments in response to the first Office Action moot.

Appellant respectfully submits that the invention of claim 1 is not about the detection of answer tone or phase reversal, or the circuitry to achieve such detection. Rather, Appellant respectfully submits that there is no disclosure, teaching or suggestion in either Wildfeuer or McNeill to detect an answer tone at the first gateway, which is in communication with the answering modem, and to transmit an answer tone message, and then to detect a phase reversal and to transmit a phase reversal message to the second gateway.

Turning to RFC-2833, the Examiner states that because RFC-2833 provides messages for supporting modem tones ANS, /ANS, ANSam and /ANSam, RFC-2833, RFC-2833 teaches that it can be combined with Wildfeuer and McNeill for rendering the invention of claim 1 obvious. However, it is respectfully submitted that the key distinction that has been made by Appellant, and has remained unanswered by the Examiner, is that RFC-2833 fails to disclose, teach or suggest how and when the messages (i.e. ANS, /ANS, ANSam and /ANSam) are utilized. Even more importantly, RFC-2833 also fails to show a phase reversal message separate from the answer tone (or amplitude-modulated answer tone) message. Rather, RFC-2833 only shows a combined phase-reversal-answer-tone message (i.e. /ANS and /ANSam). In other words, there is no disclosure, teaching or suggestion in RFC-2833 that when a first gateway modem detects an answer tone, the first gateway modem transmits an ANS message to a second gateway modem, and that when the first gateway modem later detects a phase reversal in the answer tone, the first gateway modem transmits an /ANS message (or just a phase

reversal message, i.e. "/") to the second gateway modem following the transmission of the ANS message. Also, there is no disclosure, teaching or suggestion in RFC-2833 that when a first gateway modem detects a modulated answer tone, the first gateway modem transmits an ANSam message to a second gateway modem, and that when the first gateway modem later detects a phase reversal in the answer tone, the first gateway modem transmits an /ANSam message (or just a phase reversal message, i.e. "/") to the second gateway modem following the transmission of the ANS message.

Rather, RFC-2833 merely defines the messages, and does not describe various schemes for utilization of the messages, as that is beyond the scope of RFC-2833. Further, conventional schemes, which use RFC-2833 messages, after detecting the answer tone, wait to determine whether the answer tone includes a phase reversal, and if there is no phase reversal, transmit a single message, such as ANS or ANSam, to the second gateway modem, and if there is a phase reversal, transmit a single message, such as /ANS or /ANSam, to the second gateway modem. Appellant respectfully submits that the cited references, individually or in combination, fail to disclose, teach or suggest anything more than the conventional art, and that more than a single message is transmitted for detecting an answer tone with phase reversal.

Appellant respectfully submits that because the phase reversal appears every 450ms, transmission of a single/combined message creates a delay, because it would require the first gateway to wait for the phase reversal to occur before determining the type of message to be sent to the second gateway. As a result, the second gateway cannot

start generating an answer for its local client modem until the single/combined message arrives from the first gateway. In contrast, the invention of claim 1 provides for separate messages, and as a result, the second gateway can receive the answer tone message first and start generating an answer tone, without any delay, while the first gateway is determining a phase reversal to send a second message to the second gateway.

Accordingly, for the reasons stated above, Appellant respectfully submits that claim 1 is patentably distinguishable over Wildfeuer, McNeill and RFC-2833, individually or in combination, and should be allowed. Further, independent claims 7, 13 and 18 should also be allowed for similar reasons. Also, claims 3, 6, 9, 15 and 20 depend from claims 7, 13 and 18, and should also be allowed.

CONCLUSION

Based on the foregoing reasons, the present invention, as defined by independent claims 1, 7, 13 and 18, and claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, claims 1, 3, 6, 7, 9, 13, 15, 18 and 20 pending in the present application are patentably distinguishable over the art cited by the Examiner. As such, and for all the foregoing reasons, an early allowance of claims 1, 3, 6, 7, 9, 13, 15, 18 and 20 pending in the present application is respectfully requested.

This Appeal Brief is submitted herewith with an Appendix of the appealed claims and the requisite fee for filing the Appeal Brief.

Respectfully Submitted,
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Date: 2/28/08

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APPENDIX OF CLAIMS ON APPEAL

Claim 1: A communication method for use by a first gateway device to enable communication between a first modem and a second modem, said first gateway device being capable of communicating with said first modem over a first communication line, said first gateway device being capable of communicating with a second gateway device over a packet network, said second gateway device being capable of communicating with said second modem over a second communication line, said method comprising:

receiving a call request for said first modem from said second gateway device over said packet network;

placing a call to said first modem over said first communication line in response to said receiving;

detecting an answer tone transmitted from said first modem over said first communication line in response to said placing;

transmitting a first message indicative of said answer tone to said second gateway device over said packet network;

detecting a phase reversal in said answer tone; and

transmitting a second message indicative of said phase reversal to said second gateway device over said packet network.

Claim 3: The method of claim 1, wherein said first message is indicative of an amplitude-modulated answer tone.

Claim 6: The method of claim 1, wherein said second gateway device includes an echo canceller, and the method further comprises disabling said echo canceller in response to receiving said message indicative of said phase reversal from said first gateway device.

Claim 7: A first gateway device configured to enable communication between a first modem and a second modem, said first gateway device being capable of communicating with said first modem over a first communication line, said first gateway device being capable of communicating with a second gateway device over a packet network, said second gateway device being capable of communicating with said second modem over a second communication line, said first gateway device comprising:

a receiver configured to receive a call request for said first modem from said second gateway device over said packet network;

a call module configured to place a call to said first modem over said first in response to said receiver receiving said call request;

an answer tone detector configured to detect an answer tone transmitted from said first modem over said first communication line in response to said call;

a transmitter configured to transmit a first message indicative of said answer tone to said second gateway device over said packet network;

a phase reversal detector configured to detect a phase reversal in said answer tone; and

said transmitter further configured to transmit a second message indicative of said phase reversal to said second gateway device over said packet network.

Claim 9: The first gateway device of claim 7, wherein said first message is indicative of an amplitude-modulated answer tone.

Claim 12: The first gateway device of claim 7, wherein said second gateway device includes an echo canceller, and said second gateway device disables said echo canceller in response to receiving said message indicative of said phase reversal from said first gateway device.

Claim 13: A communication method for use by a first gateway device to enable communication between a first modem and a second modem, said first gateway device being capable of communicating with said first modem over a first communication line, said first gateway device being capable of communicating with a second gateway device over a packet network, said second gateway device being capable of communicating with said second modem over a second communication line, said method comprising:

receiving a call from said first modem over said first communication line for said second modem from;

placing a call request to said second gateway device over said packet network in response to said receiving;

receiving a first message indicative of an answer tone from said second gateway device over said packet network in response to said placing;

receiving a second message indicative of said phase reversal from said second gateway device over said packet network in response to said placing; and

disabling an echo canceller of said first gateway device in response to said receiving said second message indicative of said phase reversal.

Claim 15: The method of claim 13, wherein said first message is indicative of an amplitude-modulated answer tone.

Claim 18: A first gateway device configured to enable communication between a first modem and a second modem, said first gateway device being capable of communicating with said first modem over a first communication line, said first gateway device being capable of communicating with a second gateway device over a packet network, said second gateway device being capable of communicating with said second modem over a second communication line, said first gateway device comprising:

a modem receiver configured to receive a call from said first modem over said first communication line for said second modem from;

a call module configured to place a call request to said second gateway device over said packet network in response to said call;

a network receiver configured to receive a first message indicative of an answer tone from said second gateway device over said packet network in response to said call request;

said network receiver further configured to receive a second message indicative of said phase reversal from said second gateway device over said packet network in response to said call request; and

an echo canceller, wherein said first gateway device disables said echo canceller in response to said message indicative of said phase reversal.

Claim 20: The first gateway device of claim 18, wherein said first message is indicative of an amplitude-modulated answer tone.

EVIDENCE APPENDIX

(NONE)

RELATED PROCEEDINGS APPENDIX

(NONE)